Programming Project 4: Consistent Hashing-based Naming Service

Project Members:

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Compile Instructions:

First terminal:

$ ./compileProject.sh
$ ./runBootstrap.sh

Second terminal:

$ ./compileProject.sh
$ ./runNS1.sh

BootStrap Command list:

1. **lookup key:** retrieves the value corresponding to the given key (if the key is in the system). If the given key is not in the system, “Key not found” should be printed. In addition to the value, these commands should also print out the sequence of server IDs that were contacted and the ID of the server from which the final response was obtained.
2. **Insert key value:** should insert the key-value pair into the system. The command should print out the ID of the server into which the key-value pair was inserted and the sequence of server IDS that were contacted
3. **delete key:** should delete the key-value pair corresponding to the given key. If successfully deleted, “Successful deletion” should be printed. If the key was not in the system “Key not found” should be printed. In addition, the sequence of server IDs that were contacted in the deletion process should be printed.

NameServer Command list:

4. **enter:** the name server will enter into the system. This process is initiated by first contacting the Bootstrap server. It will figure out the range of the keys that it should maintain by following the consistent hashing protocol (i.e., traversing the existing name servers in a clockwise direction). It will acquire the key-value pairs corresponding to its range from the name server that will become its successor name server. Once the entire entry procedure is complete, a “successful entry” message is printed out. In addition, the following information is printed out: (1) The range of keys that will be managed by this server; (2) the ID of the predecessor and successor name servers; (3) the IDs of the servers that were traversed during the entry process.
5. **exit:** the name server will gracefully exit the system. The name server will inform its successor and predecessor name servers. It will hand over the key-value pairs that it was maintaining to the successor. Upon successful exit, the server will print a “Successful exit” message. It will also print out the ID of the successor and the key range that was handed over

Statement:

“This project was done in its entirety by <Ben Prestel, Jordan Harman, Timothy Vo>. We hereby state that we have not received unauthorized help of any form”